

Soil and Water Quality Monitoring Plan

Soil Monitoring

The treatment area will be included in the BMP monitoring pool for the Plumas National Forest. Protocols can be found in the BMP Evaluation Program User's Guide (USDA Forest Service 2002). The monitoring plan contained in this appendix should be used in conjunction with BMPs and design standards during implementation.

During treatment effectiveness monitoring, the percent bare ground would be recorded as both a measure of re-growth of presumably desirable plant species and long term risk of soil erosion. Areas with bare soil created by the treatment of invasive plants would be evaluated for restoration needs by a botanist and soil scientist.

Water Quality Monitoring

Water quality monitoring would be implemented in compliance with the Regional Water Quality Management Handbook. Best management practice implementation checklists will document whether, and when, the site-specific best management practices specified in NEPA analyses were implemented (BMP 16.31). The checklist will be the primary systematic means for early detection of potential water quality problems, and will be completed early enough to allow corrective actions to be taken, if needed, prior to any significant rainfall or snowmelt throughout the duration of the project.

Direct measurement of water for herbicides (BMP 5.9) will occur on the main ephemeral stream. Pre-treatment samples will serve as background samples and will be taken prior to application of any herbicide treatments. Samples will not be taken during herbicide application. Post-treatment samples will not occur until completion of scheduled applications for the year. Timing of the samples would occur during or within 48 hours of first significant precipitation event that will cause enough stream flow in the ephemeral channel to capture a grab sample. If no measurable precipitation occurs within 90 days after the herbicide treatment and/or after three years of monitoring with no positives ever recorded, the monitoring program will be suspended until the project area gets precipitation within 10 days post-treatment.

Data Collection

All samples will be grab samples of a volume required by the laboratory. At each location, the sampler will characterize conditions at the time of sampling in a water quality monitoring field log, including, but not limited to, the following information:

List of required field observations:

- herbicide treatment date, chemical, concentration and method of application;
- date and time of sample collection;
- monitoring location identification number;
- name of watercourse
- sample jar number and type of container;

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- other local influences (stream clarity, weather, other pertinent notes or unusual conditions observed at the time of sample collection);
- any deviations related to the location or depth of sample collection; and
- name of individual(s) collecting the sample.

Each sample jar will also be labeled with the following information in waterproof ink:

- date and time of sample collection;
- monitoring location identification number;
- name of watercourse;
- sample jar number;
- preservatives added, if any;
- name of individual(s) collecting the sample;
- type of sample; and
- chemical(s) to be analyzed.

A chain-of-custody form will be completed to trace the possession and handling of the samples from the point of collection through delivery to the laboratory. Individual(s) collecting, handling, or transporting the samples will sign and record the date and time of their possession of the samples.

Sample Handling

Extreme care will be taken to prevent sample contamination. Personnel involved in collecting samples will not participate in herbicide application. The collector will not have any herbicide or other contaminant on his/her clothing, hands, or boots. The sample containers will be obtained from a state-certified laboratory and kept away from all herbicides and related equipment. Sample containers will not be transported or stored with herbicide application equipment.

Collected samples will be stored and transported in a light-proof cooler. The samples will be sent to a state-certified laboratory for analysis consistent with holding time requirements for the chemicals to be analyzed. The Forest Service and the laboratory will initiate special procedures to ensure that concentration or other information is not lost due to expiration of the holding times. The laboratory will be directed either to analyze for the specific chemicals immediately upon arrival.

Laboratory Analyses

Laboratory analyses will be conducted to determine whether chemical residue from herbicide applications is found in downstream water bodies. The state-certified laboratory selected to perform the analyses for the Forest Service will provide methodology (specific analysis techniques and EPA Standard Method) for each chemical to be tested. The laboratory results will include a description of the analysis method, the current method detection limits, reporting limits, and practical quantification limits, as appropriate.

Samples will be stored in accordance with laboratory standard operating procedures. Compliance with laboratory-approved storage procedures, and with maximum holding periods allowed by laboratory methods, will be documented, and, as described above, a chain-of-custody record will be maintained for each sample jar.

Reporting

Water quality data will be compiled by the Forest Service hydrologists annually.

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The absence of herbicide detection will suffice to demonstrate the efficacy of the BMPs, standard operation procedures, and project design standards. Based on the monitoring results, project design standards, and invasive treatment results herbicide treatments method may all be altered.

References

USDA Forest Service 2002. Investigating Water Quality in the Pacific Southwest Region Best Management Practices Evaluation Program (BMPEP) User's Guide. USDA Forest Service Pacific Southwest Region, Vallejo, CA.